VACUUM CLEANER TANK ASSEMBLY

TECHNICAL FIELD OF THE INVENTION

The present invention relates in general to vacuum cleaners and in particular to a vacuum cleaner assembly for securely housing a filter bag inside a receptacle or tank.

BACKGROUND OF THE INVENTION

Vacuum cleaners often include a disposable filter bag. The filter bag collects particulate matter from air passing through the filter bag for subsequent disposal. Typically, the filter bag is removably mounted in a tank or other receptacle associated with the vacuum cleaner. When the filter bag is full, it is removed and an empty filter bag is installed in the tank.

Most filter bags include a cardboard plate with an aperture aligned to an opening in the filter bag. To install an empty filter bag in the vacuum cleaner tank, in such a way as to prevent unwanted movement of the filter bag, the aperture in the cardboard plate is pushed on to a filter bag mount. The filter bag mount is connected to the vacuum cleaner tank and to a hose. The combination usually remains in place due to friction or an interference fit. An aperture in the filter bag mount allows dirty air to pass from the hose to the filter bag where the dirt is collected. In order to reduce the amount of dirty air that escapes (i.e., air which fails to pass through the filter bag), and to help maintain the position of the filter bag, the filter bag mount may include a raised flange or other seal.

Prior art systems allow an individual to replace the filter bag in such a way as to reduce movement and dirty air escape, however, these prior art systems suffer from certain drawbacks. The filter bag mount with raised flange requires the user to force and/or bend the cardboard plate into position. As a result, user's often find it difficult to install a new filter bag. Further, damage may occur to the cardboard plate, thereby increasing the amount of dirty air that escapes or possibly resulting in the cardboard plate and bag becoming entirely dislodged.

SUMMARY OF THE INVENTION

In accordance with a first aspect of the invention, a vacuum cleaner assembly for attaching a filter bag to a receptacle, the filter bag including a plate, and the receptacle including an inlet, is provided. The assembly includes a filter bag retainer. The assembly also includes a first fitting extending from outside the receptacle through the tank inlet, through the filter bag retainer, and into the filter bag. A second fitting engages the filter bag retainer to trap the first fitting adjacent to the filter bag retainer.

In some embodiments, the filter bag retainer includes first and second slots for receiving the plate on the filter bag. Further, the filter bag retainer may include a threaded cylinder forming a retainer aperture, wherein the threaded cylinder is inserted through the inlet. Still further, the filter bag retainer may include a first threaded aperture, and the second fitting may include a second threaded aperture, wherein the first threaded aperture is adapted to pass through the inlet and couple to the second threaded aperture. In some embodiments, the second fitting is further adapted to hold a hose adjacent to the inlet fitting.

In a preferred embodiment, the first fitting includes a first ridged member and a second ridged member. Further, the filter bag retainer comprises a threaded cylinder and a first abutment. Still further, the second fitting includes a threaded inner surface and a second abutment. Accordingly, the assembly is adapted to trap the first ridged member against the first abutment and to trap the second ridged member against the second abutment as the threaded inner surface is tightened on to the threaded cylinder.

In any of the foregoing, the vacuum cleaner assembly may further comprise a hose, wherein the hose comprises a grooved aperture. In such an instance, the second fitting includes a ridge and the grooved aperture couples to the ridge. In the preferred embodiment, the receptacle comprises a tank.

In accordance with another aspect of the invention, a vacuum cleaner is provided. The vacuum cleaner includes a receptacle with an inlet. Further, vacuum cleaner includes a filter bag with a filter bag aperture. Still further, the vacuum cleaner includes a plate connected to the filter bag, wherein the plate also has an aperture. Yet further, the vacuum cleaner includes a filter bag retainer with first and second retainer slots, a threaded cylinder, and a cylinder abutment, wherein the plate slides into the retainer slots and the threaded cylinder is inserted into the tank aperture. In addition, the vacuum cleaner includes a first fitting with a ridged end, a non-ridged end, a first ridged member, and a second ridged member, wherein the non-ridged end is inserted through the inlet, the filter bag aperture, and the plate aperture. Also, the vacuum cleaner includes a second fitting with a threaded inner surface and a fitting abutment, wherein the threaded inner surface engages the threaded cylinder thereby forcing the first ridged member against the cylinder abutment and forcing the second ridged member against the fitting abutment.

In some embodiments, the vacuum cleaner further comprises a hose with outer ribs and inner ribs, wherein the outer ribs engage the threaded inner surface of the second fitting and the inner ribs engage the threaded end of the first fitting.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features and advantages of the present invention will become more apparent from a detailed consideration of the following detailed description of certain preferred embodiments when taken in conjunction with the drawings in which:

FIG. **1** is an exploded view of a vacuum cleaner tank assembly, constructed in accordance with teachings of the present invention.

FIG. **2** is front view of a filter bag assembly.

FIG. **3** is a top plan view of the vacuum cleaner tank assembly of FIG. **1**.

FIG. **4** is a cross sectional view taken generally along line **3**—**3** in FIG. **2**.

FIG. **5** is an enlarged view of detail A in FIG. **3**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Vacuum cleaners typically comprise a motor assembly, a tank or other receptacle, a lid, a motor assembly, a hose inlet on the receptacle, and a hose that attaches to the hose inlet at one end and has a nozzle at the other end. The lid has a rim which is designed to fit over the edge of the receptacle of the vacuum cleaner. Around the periphery of the lid are several latch ports which cooperate with latches on the receptacle in order to hold the lid on the receptacle. The lid houses a motor assembly that is in air flow communication with the receptacle through a filter. Generally, the motor assembly includes an electric motor, a power cord for use with an electrical outlet, an air impeller, various housings, and other associated equipment. The motor of the motor